Technical report

Predictive Analytics for the Claim Handling Process

Understanding the analytics behind SPSS Inc.'s solutions

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Introduction

Customer satisfaction plays an important role in determining whether your company retains current customers and receives referrals for new ones. For property and casualty insurance companies, the key to customer satisfaction is settling claims quickly and correctly. According to a recent survey from the National Association of Insurance Commissioners (NAIC), the top three reasons consumers filed formal complaints against their insurance companies in 2005 were delays, denials, and unsatisfactory settlement offers[1].

Boosting customer satisfaction is one of several concerns that your company may face today. In addition to trying to minimize delays by reducing claim cycle times, you may also seek to minimize claim handling costs and improve the productivity, accuracy, and consistency of your claim handling process, or to detect suspicious claims even earlier in the claim handling process. Perhaps your goals are even broader, and you'd like to boost the effectiveness of your marketing campaigns by targeting low-risk prospects or by presenting already satisfied claimants and policyholders with targeted cross-sell and up-sell offers.

With predictive analytics from SPSS Inc., you can optimize your entire claim handling process. SPSS Inc.'s predictive analytics solution relies on business rules—your company's wealth of experience—and combines them with predictive analytics, which uses advanced analytic techniques and decision optimization to further improve decision making based on the analysis of historic data. Predictive analytics gives your company the ability to act on this data so you can address your critical business problems. SPSS Inc.'s solution enables you to determine which claims qualify for immediate or fast-track approval, and to facilitate claim handling in other ways. You can also flag suspicious claims—those that may require the attention of more experienced adjusters or your special investigation unit (SIU).

This technical brief serves as a guide for understanding how the predictive modeling capabilities of SPSS Inc.'s solution can help you optimize your claim handling process and improve the detection of suspicious claims. It also discusses:

- The roles of business rules and predictive models in SPSS Inc.'s predictive analytics solution
- How predictive models enhance business rules to identify suspicious claims
- What differentiates SPSS Inc.'s solution from other solutions
- How predictive analytics from SPSS Inc. can help you plan for the future and adjust your claim handling process accordingly

Founded in 1968, SPSS Inc. is a leading provider of predictive analytics software and solutions. We've leveraged our expertise in predictive analytics to help insurance companies improve overall claim handling and their ability to detect suspicious claims. Eight out of the top ten global life insurance companies rely on SPSS Inc.'s predictive analytics solutions to direct, optimize, and automate specific decision processes to meet their goals[2].

1 *"NAIC Report Lists Top Consumer Complaints about Insurance Companies," National Association of Insurance Commissioners (NAIC) Web site, January 19, 2006, www.naic.org/Releases/2006_docs/consumer_complaints.htm.*

2 *"2004 Global 500,"* FORTUNE *Magazine, July 26, 2004.*

SPSS Inc.'s predictive analytics solutions optimize the claim handling process

With predictive analytics from SPSS Inc., you gain the decision support you need to optimize your claim handling process. An optimized claim handling process minimizes claim cycle times which, in turn, boosts customer satisfaction.

Your company's relationship with a customer is tested most when a customer files a claim. Customers want their lives to return to normal as quickly as possible, whether that means repairing an automobile after an accident or rebuilding a home after a fire. How quickly do customers want their claims settled? According to a survey[3] of property and casualty claimants, 94 percent of customers agreed that a quick resolution was more important than the settlement amount. When insurers settled claims in one to three days, for example, 92 percent of customers remained loyal to the insurers. However, when insurers took longer than 15 days to settle claims, more than 65 percent of customers considered changing insurance companies.

In summary, this survey found that quick and efficient settlement times promote customer loyalty and satisfaction. The survey also noted that customer dissatisfaction increased proportionally to the number of claim handlers the customers spoke with.

SPSS Inc.'s solution integrates with each step of your claim handling process. In contrast to other solutions, SPSS Inc.'s predictive analytics solution continuously scores your data, from the first notification of a claim through the settlement (see Figures 1-3).

Figure 1

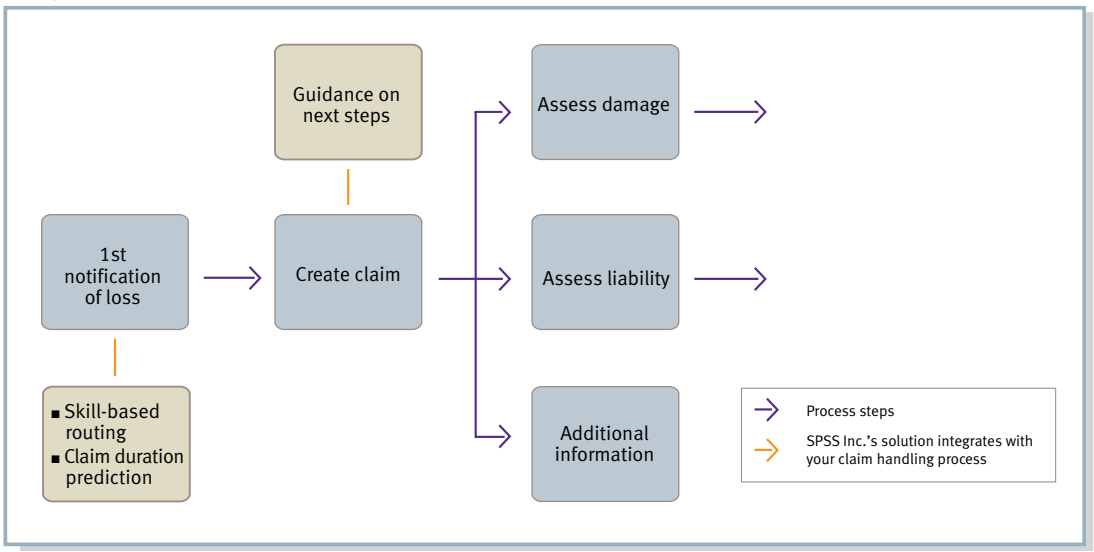

Figure 1: Predictive analytics facilitates your claim handling process.

3 *"Consumers Stress Importance of Speed Over Settlement Amount in Insurance Claims Resolution, According to Accenture Survey," International Communications Research (ICR) Web site, April 16, 2002, www.icrsurvey.com/Study.aspx?f=Accenture_claims.html.*

Figure 2

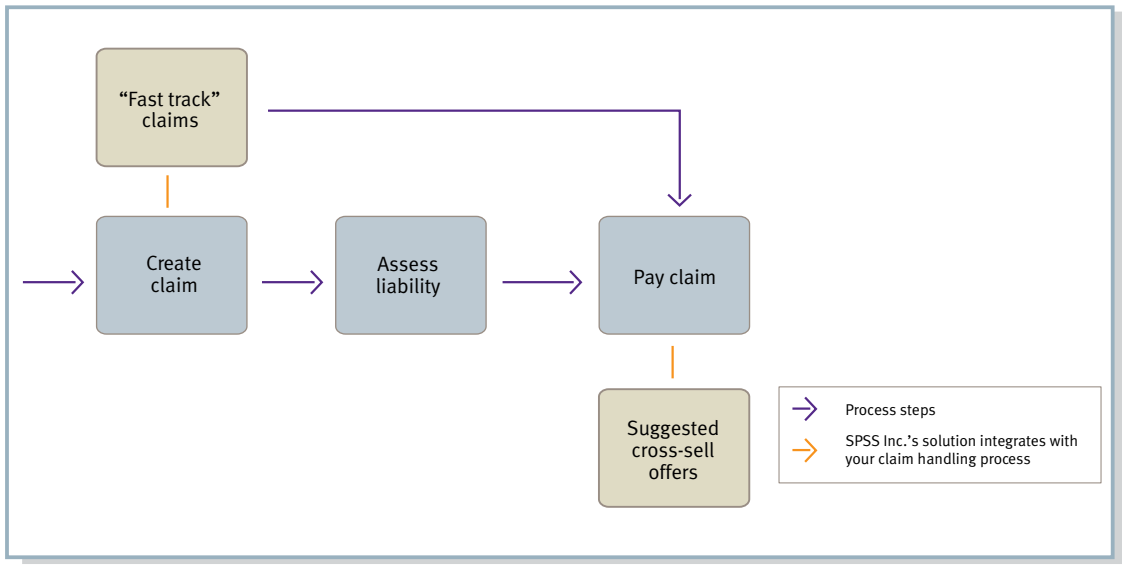

Figure 2: Control costs and improve customer satisfaction by paying low-risk claims quickly. Predictive analytics also helps improve cross-sell efforts.

Figure 3

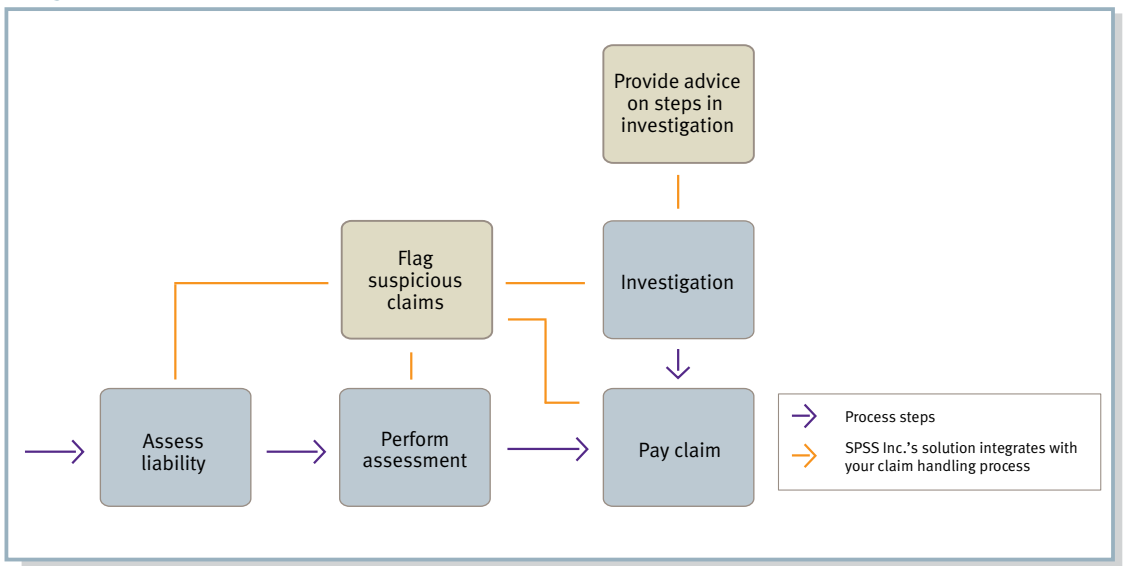

Figure 3: Predictive analytics enables your SIU to more efficiently process suspicious claims.

With SPSS Inc.'s predictive analytics solutions' decision support, you can optimize your claims process through a combination of intelligent claim handling and straight-through claims processing, or "fast-tracking." When a claim notification arrives, the SPSS Inc. solution predicts the duration of the claim process. Then it matches each claim with the adjuster who is best equipped to handle it—so junior adjusters receive the simple claims while more experienced adjusters receive the complex claims.

Detecting suspicious claims

The identification of suspicious claims is an important aspect of the claim optimization process.

In the United States, approximately $30 billion in losses is attributed to property and casualty insurance annually[4]. As illustrated in Figure 4, most fraud goes undetected. While adjusters estimate that between 15-20 percent of all claims are fraudulent, only 1-2 percent are typically referred to an insurer's SIU. Of those claims that are referred, 60 percent are investigated, and 50-70 percent of those investigated claims are determined to be fraudulent. The end result? Approximately .3 percent of all claims are identified as fraudulent. However, the remaining 14.7-19.7 percent of fraudulent claims are never investigated, so they remain undetected. While the business value of detecting suspicious claims is significant, so are the challenges—you don't know whether a claim is fraudulent or not if it is never investigated.

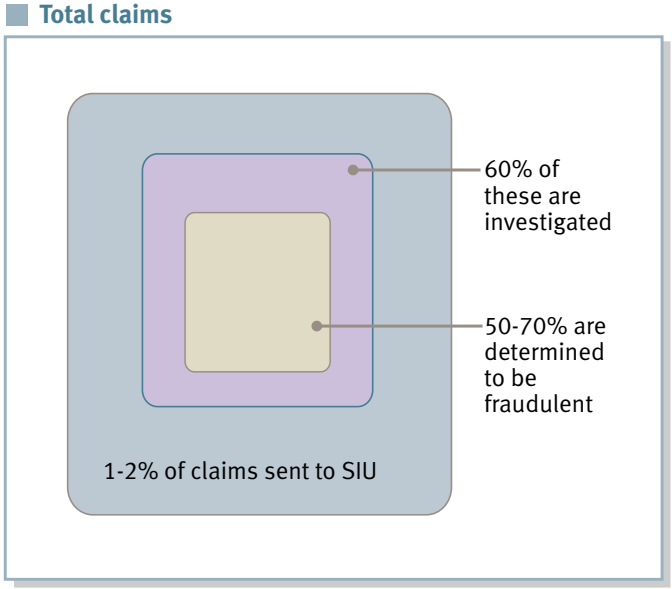

Figure 4: Approximately .3% of all claims are identified as fraudulent.

Once a claim has been entered in, the SPSS Inc. solution first applies business rules to the claim to assess the likelihood of it being suspicious. For example, if a customer with an extensive claim history and recently increased coverage calls in to report a loss under the recent coverage addition, the SPSS Inc. solution will flag it for special handling. The loss adjuster will be alerted to gather more detailed information and listen carefully to the customer. As the agent inputs information, the solution will score the notification of loss and inform the adjuster whether or not the claim is likely to be suspicious. The result? SPSS Inc.'s solution "fast-tracks" low risk claims and flags suspicious claims for further review. This means your best customers are rewarded with a quick settlement, and adjusters can confidently spend their time investigating suspicious claims.

4 *The Insurance Information Institute Web site, 2004, www.iii.org/media/facts/statsbyissue/fraud/.*

Marketing to the right prospects

In addition to helping your company optimize its claim handling process, SPSS Inc. can also help you optimize your marketing campaigns. SPSS Inc.'s solution enables you to detect suspicious claims—and prevent future occurrences—by marketing to the right prospects. When you incorporate customer profiles from the solution into your marketing analysis, you'll know which prospects present the greatest potential risk and which offer the greatest potential value.

Moreover, since SPSS Inc.'s solution enables you to fast-track certain claims, you'll be able to easily pinpoint those customers who may have been most satisfied with claim cycle times and the settlement. Your marketing department can confidently contact these customers with cross-sell and up-sell offers. Or, you can ask these customers if they would be willing to refer your company to their friends and family.

How does SPSS Inc.'s predictive analytics solution work?

Predictive analytics from SPSS Inc. uses a combination of business rules and predictive modeling to score claims and determine the appropriate path that they should take. Because the solution scores claims in real time, agents receive guidance on proper claim handling while they are interacting with customers, and are automatically provided with "smart questions" to elicit additional information. Adjusters and investigators can use SPSS Inc.'s solution to create risk profiles and predictive models from their desktops—they don't have to rely on your IT department for scripting or programming.

SPSS Inc.'s predictive analytics solution begins by using **business rules** as a foundation for claim process optimization and the early detection of suspicious claims. Business rules are patterns that represent existing knowledge about customers, customer behavior, policies, and claims. SPSS Inc. provides a pre-defined list of more than 200 business rules for property and casualty insurance companies. In addition, we rely on your experts, including SIU investigators and claims adjusters, to contribute additional business rules based on your company's actual experience. Incorporating your experience into the business rules increases the accuracy of the system and provides insight into how to handle a claim.

Since business rules provide insight into your past experience with claims, they play a crucial role in the early detection of suspicious claims. Examples of business rules for the detection of suspicious claims include:

- Short policy period prior to the date of loss
- Unusually long period between the date of loss and the report date
- Recent additions to the policy coverage
- Recent reduction to the policy deductible for a particular type of loss
- Unusual number of soft tissue injuries in one vehicle

You can begin claim process optimization by applying business rules to all incoming claims. Some examples of business rules for process optimization include:

- Low-risk and low-value claim
- Long term policyholder
- Very little or no claims history

Business rules are most effective when used in conjunction with predictive models. While business rules alert agents to potential problems, relying solely on business rules to select claims leads to a high rate of false positives. And while predictive models can diminish the number of false positives, such models work best when combined with business rules.

Predictive models refine business rules to identify suspicious claims

SPSS Inc.'s solution enhances the insight gained through business rules by using **predictive models** to search for unknown relationships, detect suspicious patterns, and identify new claims to be reviewed.

Predictive modeling is a means for understanding your data, deriving value from it, and then consistently modifying your models—based on additional data—so that your organization continues to benefit from it. With SPSS Inc.'s proven predictive modeling techniques you can:

- Correct experiential bias that may be found in some business rules
- Reduce false positives and improve your investigation success rate
- Find new forms of fraud in claims that were previously not investigated
- Discover new fraud trends

When predictive models are programmed to detect additional data attributes and new or modified business rules, the results are first analyzed and then interpreted. Once your investigators and SPSS Inc.'s analytics team determine that the models are providing reliable results, the models can be deployed and will become increasingly more effective at scoring claims. Since predictive modeling is an ongoing process, predictive models will always be subject to revision.

In order for you to get the most value from SPSS Inc.'s predictive analytics solution, SPSS Inc. has developed an overruling mechanism that combines the evaluations of the business rules with the results of the predictive models to create one outcome. This mechanism provides insight into how your business rules are refined by predictive models, enabling your SIU manager and adjusters to learn from the results and continually enhance their knowledge.

Predictive modeling techniques

SPSS Inc.'s predictive analytics solution relies on supervised and unsupervised modeling techniques to help you optimize the claim process and detect suspicious claims at the early stages. Supervised modeling techniques are used with claims that have a known outcome; they have been investigated previously and fraud may or may not have been detected. Unsupervised modeling techniques are most effective for claims in which particular groupings or patterns are unknown. These techniques are best for discovering new types of suspicious claims, especially within categories of claims that have not been investigated in the past.

Supervised modeling techniques optimize your claim process

Through supervised modeling techniques, SPSS Inc.'s solution can also help you address the problems that are part of an inefficient claim process:

- Early identification of complex claims
- Early identification of expensive claims
- Early identification of the duration of a claim
- Possibility of attorney representation
- Difficulty in assessing liability or estimating damage
- Possibility of a required correction in repair calculation
- Assessment of how best to treat a complex claim
- Improving the reserve amount

When analyzing a batch of claims, supervised modeling techniques enable you to identify the outcome earlier in the claim process. Perhaps you'd like to know if it will take a long time to settle a certain claim or set of claims. Now that you know what you're looking for, you can select the claims that meet this particular outcome (long duration). Supervised modeling techniques will then generate the characteristics of claims that have a higher likelihood of having a long duration, such as claims involving multiple parties living in different postal or ZIP codes. The results that are identified as valuable can then be integrated into the final predictive model that will be used during claim handling.

Supervised and unsupervised modeling techniques detect suspicious claims

Perhaps you'd like to identify suspicious claims at an earlier stage. The SPSS Inc. solution is unique in that it uses both supervised and unsupervised modeling techniques to help you do this. First, by reducing false positives and, second, by discovering new forms or patterns of fraud.

The value of these two approaches is quite different. Although supervised modeling techniques can help you reduce false positives and improve the effectiveness of your investigation process, companies rarely investigate more than one percent of all claims. With unsupervised modeling techniques, however, you may find fraud in the remaining 99 percent of claims that are typically never invested. As a result, the business potential of identifying entirely new forms of fraud is much higher.

With supervised modeling techniques, you can improve the quality of referrals (reducing false positives) to your SIU by identifying those referrals that didn't result in an investigation. You can also pinpoint referrals that didn't result in a successful investigation. Since your goal is to pinpoint investigated claims that were suspicious, begin by selecting claims that were investigated. The supervised modeling techniques will then generate the characteristics of claims that have a lower or higher chance of being suspicious. A claim involving an elderly woman with few past claims, for example, has little chance of being suspicious. Once you know which characteristics point to low-risk claims—such as a specific age range for claimants or the length of time that they've been insured—you can build those results into your final predictive model and reduce the total of false positives sent to your SIU.

The SPSS Inc. solution's unsupervised modeling techniques can also help you identify new types and forms of fraud—and positively impact your bottom line. With unsupervised modeling techniques you can identify irregular claims, suspicious claim notification patterns, and referrals that were not caught by automatic fraud detection.

Finding new forms of fraud: anomaly detection

Anomaly detection routines find unusual behavior, enabling your organization to identify new forms of fraudulent behavior and consequently increase your detection rates.

In order to find previously unidentified suspicious claims, predictive analytics provides a number of anomaly detection approaches to identify unusual cases. These routines may include the following:

- Predict the expected value of claims based on the damage, type of policy, type of injury, and number of people and vehicles involved. Based on these predictions, find a number of cases that fall far outside the expected value.
- Group claims based on the claim value, claim type, type of customer, and a number of other variables. Use this information to find segments of claims that look very different from all the other claims.
- Look for sequences of medical claim events and lawyer engagement; identify claims that follow an unusual pattern
- Identify blatantly suspicious claims, such as those with the same attorneys and medical providers or multiple claims with the same VINs and phone numbers

Investigators can then inspect these newly discovered patterns and determine whether they should be added to the SPSS Inc. software rulebase, which will further refine the identification of suspicious claims.

The advantages of SPSS Inc.'s predictive analytics solution

Your organization can choose from a variety of solutions that promise to optimize your claim handling process and identify suspicious claims. You can implement a generic solution that cannot be customized for your specific business needs. Or you can implement a predictive and rules-based system that doesn't allow for model refinement—leaving you unable to identify new forms of suspicious claims. Another option is to engage an outside service provider to identify suspicious claims for your organization and rely on their internal timelines for changing and updating rules and predictive models.

Or you can choose SPSS Inc.'s solution, which is uniquely capable of helping your organization improve the entire claim handling process, both today and in the future. This solution differs from other solutions because it:

- Relies on your business rules and predictive analytics
- Assesses and analyzes data throughout the entire claim handling process—so there's no need for you to take your data offline and then enter it back into the solution
- Integrates with the claim handling process in real time
- Enables users to create a risk profile for a claim and execute analytical models and processes without programming or involving IT
- Employs an open, standards-based architecture and integrates with your existing claim handling solution and other business applications and processes
- Uses both supervised and unsupervised predictive modeling techniques, enabling you to find new forms of fraud
- Enables your agents to use dynamic, "smart" questioning

Unlike generic and rule-based offerings, SPSS Inc.'s solution doesn't assume that each insurance company is the same or prevent you from revising your predictive models. And it doesn't expect you to rely on an outside service provider. Rather, the solution is built to leverage your existing systems and resources to meet your organization's specific needs.

Conclusion

The key to optimizing your claim handling process—and increasing customer satisfaction—is choosing a customizable solution that uses and continually refines predictive models. SPSS Inc.'s predictive analytics solution has a comprehensive set of capabilities which enable your organization to fast track low-risk claims and monitor and flag suspicious claims. The solution begins by using business rules as a foundation for consistent fraud identification. Next, predictive models refine the business rules and identify new claims to be reviewed. Then SPSS Inc.'s solution deploys regular anomaly detection routines to identify new "suspects" as well as new fraudulent behavior. Finally, the solution refines its predictive models to ensure that results are consistently improved over time.

When you select SPSS Inc.'s predictive analytics solution to reduce claim cycle times and improve the detection of suspicious claims, you will:

- Develop business rules based on our joint expertise
- Implement highly accurate predictive models
- Identify new forms of fraud
- Learn suspicious patterns from past claims
- Create multiple models for different regions and catastrophic events
- Have easy-to-understand referral reasons
- Immediately implement updates to enhance your suspicious claim detection efforts
- Understand the reason for a claim scoring as high-risk or low-risk

By taking advantage of the solution's ability to interoperate with your claim handling database and operational systems, you take a major step toward becoming a Predictive Enterprise—an organization that uses data to proactively anticipate business issues and act in the right way, at the right time, to achieve its objectives. As a result, your organization will be better equipped to boost customer satisfaction, reduce claim cycle times, minimize claim handling costs, and improve the detection of suspicious claims.

The choice is yours. Contact SPSS Inc. Sales to learn more about how our predictive analytics solutions can help your organization.

About SPSS Inc.

SPSS Inc. (NASDAQ: SPSS) is a leading global provider of predictive analytics software and solutions. The company's predictive analytics technology improves business processes by giving organizations consistent control over decisions made every day. By incorporating predictive analytics into their daily operations, organizations become Predictive Enterprises—able to direct and automate decisions to meet business goals and achieve measurable competitive advantage.

More than 250,000 public sector, academic, and commercial customers rely on SPSS technology to help increase revenue, reduce costs, and detect and prevent fraud. Founded in 1968, SPSS is headquartered in Chicago, Illinois. For additional information, please visit **www.spss.com**.

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